Docket No.: 050159-0040 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of	:	Customer Number: 20277
Anders WALLENBECK, et al.	:	Confirmation Number: 6550
Application No.: 10/528,079	:	Tech Center Art Unit: 1797
Filed: March 17, 2005	:	Examiner: Cephia D. Toomer

For: FUEL ADDITIVE COMPOSITION AND ITS PREPARATION

TRANSMITTAL OF APPEAL BRIEF

Mail Stop Appeal Brief
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith is Appellant's Appeal Brief in support of the Notice of Appeal filed February 1, 2010. Please charge the Appeal Brief fee of $540.00 to Deposit Account 500417.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due under 37 C.F.R. 1.17 and 41.20, and in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

MCDERMOTT WILL & EMERY LLP

Aamer Syed

Aamer S. Ahmed
Registration No. 58,958

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 ASA:MWE
Facsimile: 202.756.8087
Date: March 29, 2010

Please recognize our Customer No. 20277 as our correspondence address.

Docket No.: 050159-0040 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of	:	Customer Number: 20277
Anders WALLENBECK, et al.	:	Confirmation Number: 6550
Application No.: 10/528,079	:	Tech Center Art Unit: 1797
Filed: March 17, 2005	:	Examiner: Cephia D. Toomer

For: FUEL ADDITIVE COMPOSITION AND ITS PREPARATION

APPEAL BRIEF

Mail Stop Appeal Brief
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Appeal Brief is submitted in support of the Notice of Appeal filed February 1, 2010, wherein Appellant appeals from the Primary Examiner's rejection of claims **2, 3, 8, 9 and 14-17**.

Real Party In Interest

This application is assigned to SYSTEMSEPARATION SWEDEN AB by assignment recorded on March 17, 2005, at Reel 017269, Frame 0925.

Related Appeals and Interferences

Appellant is unaware of any related appeals and interferences.

Status of Claims

1. Claims canceled: 1 and 4-7
2. Claims withdrawn from consideration, but not canceled: 10-13
3. Claims pending: 2, 3 and 8-17
4. Claims allowed: None
5. Claims rejected: 2, 3, 8, 9 and 14-17
6. Claims on appeal: 2, 3, 8, 9 and 14-17

Status of Amendments

Claim 14 was amended in the after final amendment filed under 37 C.F.R. § 1.116 on December 23, 2009. The Examiner indicated the after final amendment would be entered for purposes of appeal in the Advisory Action mailed on January 4, 2010.

Summary of Claimed Subject Matter

An aspect of the invention, per claim 14 is a fuel additive composition for the reduction/removal of vanadium-containing ash deposits in gas turbines and others by combustion of vanadium-containing fuel driven apparatuses, (page 1, lines 1-11). The composition comprises an active ingredient dispersed in at least one liquid selected from the group consisting of liquids soluble in oil, by means of at least one dispersant selected from the group consisting of low molecular weight dispersants and high molecular weight dispersants, (page 13, lines 19-22).

The active ingredient is an inorganic oxygen-containing compound of a metal in particle, non-crystalline form when it is added to the fuel, (page 7, lines 1-19). When heated in a combustion flame, the active ingredient liberates a gaseous substance by

evaporation and forms a corresponding metal oxide having a crystalline porous structure, (6, lines 13-28). The dehydration and decomposition of the active ingredient takes place in the combustion process. (page 31, lines 10-21). Furthermore, the active ingredient comprises a compound of a metal capable of forming a vanadate with vanadium of the ash deposits, (page 6, lines 12-28). The active ingredient and the corresponding metal oxide have a particle size distribution within the range of from 0.1 to 2 micron, and the corresponding metal oxide has a density of at most 2.0 g/cm^3, (page 11, lines 7-26)

Grounds of Rejection To Be Reviewed By Appeal

Claims 2, 3, 8, 9 and 14-17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Cheng (US 4,229,309).

Argument

Claim Rejections under 35 U.S.C. § 103(a) as being unpatentable over Cheng

Claims 2, 3, 8, 9 and 14-17

The issue for these claims is whether the cited reference Cheng, teaches or suggests a fuel additive composition comprising an inorganic oxygen-containing active material compound of a metal in particle non-crystalline form. An example of this active material compound is magnesium hydroxide $Mg(OH)_2$.

Examiner's Position

It is the Examiner's position that Cheng teaches the use of magnesium oxide (MgO) as a fuel additive, and that this compound would have similar properties as the active material recited in instant claim 14.

Specifically, in the final office mailed on August 3, 2009, it was asserted that Cheng teaches a stable fluid magnesium containing dispersion and the preparation thereof in a dispersant fluid. The Examiner concedes that Cheng does not teach active material particles capable of forming a vanadate as required in claim 14. Nonetheless, it was asserted in the final office action, that since Cheng allegedly teaches the same compound as that of the claims, it would be reasonable to expect that particles of Cheng would have similar properties. Furthermore, in the advisory action mailed on January 4, 2010, it was asserted that Cheng allegedly teaches that MgO dispersions can be further reacted to form dispersions of the corresponding derivative. As an example of this, the Examiner asserts that the MgO can be reacted with H_2O to form $Mg(OH)_2$.

Appellant's Position

Claim 14 is allowable over Cheng because Cheng simply does not teach or suggest a fuel additive composition comprising an active ingredient wherein the active ingredient is **an inorganic oxygen-containing compound of a metal in particle, non-crystalline form**, as recited in claim 14.

An example of the fuel additive as recited in claim 14, is described, in example 1 in which active ingredient magnesium hydroxide $Mg(OH)_2$, having a non-crystalline form (powder) is dispersed in Rhodafac ester, (see page 24, lines 8 to page 25, lines 20). As explained in Examples 1 and 2 in the specification, when a metal hydroxide such as magnesium hydroxide ($Mg(OH)_2$) in particle form (non-crystalline form) is heated, water leaves the magnesium hydroxide and metal oxide crystals are formed, (in the examples magnesium oxide (MgO) is formed) and during this formation, water is released.

In contrast to the fuel additive composition as recited in claim 14, the fuel additive of Cheng is a magnesium oxide (MgO) dispersion, not an inorganic oxygen-containing compound of a metal in particle, non-crystalline form (see col. 7, line 5-8, which refer to the product as being exemplified in Example 12, col. 4, line 66 to col. 5, lines 9). Moreover, although Cheng describes obtaining a MgO dispersion via a dehydration of magnesium hydroxide, this occurs during production of the MgO and **Cheng does not teach or suggest that an inorganic oxygen-containing compound of a metal in particle, non-crystalline form is part of a fuel additive**, as recited in instant claim 14.

As such, it is clear that Cheng fails to teach or suggest the fuel additive as recited in claim 14.

Moreover, Applicants discovered that there is a clear advantage to a fuel additive comprising an active material, which is an inorganic oxygen-containing compound of a metal in particle, non-crystalline form. That advantage is reduced ash formation during combustion.

The rapid degradation of the inorganic oxygen-containing compound of a metal in particle, non-crystalline during combustion provides a better distribution of metal oxide in the combustion gases and therefore a larger and more reactive surface area and better chance for the metal to react with vanadium, (see specification at page 4, line 34 to page 5, line 2). This is accomplished because micro explosions in the flame will form very small nano-sized metal oxide particles when the nano-sized metal hydroxide particles are transformed to metal oxide. In addition, the micro explosions accelerate the metal oxide crystals in all directions increasing speed frequency for the merging of the corrosive ash droplets, (see specification at page 4, line 21 to page 5, line 2).

Because of the formation of small, low density and porous metal oxide crystals, the instant fuel additive composition inhibits deposit build-up from interfering with the heat transfer on the tubular walls and thus result in a higher energy out-put as compared to conventional metal oxide based products such as described in Cheng.

On the other hand, Cheng magnesium hydroxide at a production stage during manufacturing of his product and converts the magnesium hydroxide to MgO, which is stabilized in a liquid solution and used as fuel additive (see Cheng claim 11). Cheng does not teach the starting magnesium hydroxide as forming part of the fuel additive because Cheng only used MgO. Nothing more happens to the MgO in the flame, so the surface area of magnesium does not change when the product MgO is used.

Moreover, the advantageous results obtained by using the fuel additive as recited in claim 14 are unexpected. As clearly demonstrated in the parallel test runs with a conventional high performance additive in the gas-turbine power plant described in Example 4.

In Example 4, the fuel additive as recited in claim 14 was compared to magnesium oxide as disclosed in Cheng, and an unexpected improvement in the reduction of ash deposits was obtained using the composition recited in claim 14, (see page 28, line 25 to page 31, line 6). As explained in Example 4, ash deposits were easy to remove by hand when the fuel additive as recited in claim 14 was used, (see page 29, lines 31-35).

In contrast, the ash deposits could not be removed by hand when the MgO product as disclosed by Cheng was added into the fuel, (see page 29, lines 31-35). When an Applicant timely submits evidence traversing a rejection, the Examiner must reconsider the patentability of the claimed invention, (see MPEP § 2145). The ultimate determination of patentability must be based on consideration of the entire record, by a preponderance of evidence, with due consideration to the persuasiveness of any arguments and any secondary evidence. *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In view of the evidence in the present specification, and that no evidence was provided by the Examiner to show that the results are expected, it is submitted that Applicants have presented a persuasive case of unexpected results.

Furthermore, regarding the assertion that Cheng teaches MgO dispersions that can be further reacted to form dispersions of the corresponding derivative, for example, that the MgO can be reacted with H_2O to form $Mg(OH)_2$, it is submitted that a person having ordinary skill in

the art would not react MgO with H_2O as this would destroy the crystalline MgO as recited in claim 14. Thus, the Examiner is applying Cheng n a manner that does against its teaching.

Thus, a person having ordinary skill in the art would not have found it obvious to modify Cheng in such a manner as to achieve the fuel additive as recited in claim 14 as the subject matter of claim 14 achieves an unexpectedly improved reduction in ash deposits.

Accordingly, it is clear that claim 14 is allowable over the cited prior art. Furthermore, claims 2, 3, 8 9 and 15-17 depend from and further define the subject matter of claim 14 and therefore are also allowable.

Conclusion

Based upon the arguments submitted supra, Appellant respectfully submits that the Examiner's rejections under 35 U.S.C. § 103 are not legally viable. Appellant, therefore, respectfully solicits the Honorable Board to reverse the Examiner's rejection of claims 2, 3, 8, 9 and 14-17.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP

Aamer S. Ahmed
Registration No. 58,958

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 ASA:MWE
Facsimile: 202.756.8087
Date: March 29, 2010

Please recognize our Customer No. 20277 as our correspondence address.

CLAIMS APPENDIX

2. The fuel additive composition according to claim 14, wherein said active ingredient is capable of forming vanadates having a melting point within the range of from 650° C to 2000° C.

3. The fuel additive composition according to any of claims 14 or 2, wherein said metal is magnesium or yttrium.

The fuel additive composition according to claim 14, wherein said active ingredient or oxide comprises from 10 to 65% by volume, calculated on the total volume of the composition.

8. The fuel additive composition according to claim 14, wherein said active ingredient or oxide comprises from 10 to 65% by volume, calculated on the total volume of the composition.

9. The fuel additive composition according to claim 14 , wherein said at least one dispersant is an anionic or amphoteric low molecular weight dispersant.

10. A process for the preparation of a fuel additive composition as defined in claim 14, which process comprises

mixing a powder of an inorganic oxygen-containing compound of a metal capable of forming a vanadate with vanadium of ash deposits from vanadium-containing fuel and which inorganic oxygen-containing compound when heated up in a combustion flame liberates a gaseous substance by evaporating to form to the corresponding oxide having a crystalline porous low density structure or a powder of said oxide having a crystalline porous low density structure into a mixture of at least one liquid selected from the group consisting of liquids soluble in oil with at least one dispersant for said inorganic oxygen-containing metal compound or oxide selected

from the group consisting of low molecular weight dispersants and high molecular weight dispersants using shear forces to form a homogenous pumpable premix and

subjecting the premix to a treatment comprising size degradation and dispersant coating to a particle size distribution of the inorganic oxygen-containing metal compound and oxide essentially within the range of from 0.1 to 2 micron, preferably from 0.1 to 1 micron, under centrifugal or oscillation forces in the presence of a grinding medium and/or ultrasonic treatment until a plot of the sediment height in samples taken periodically during said treatment and centrifuged at a fixed rate for a fixed period versus time plateaus and the viscosity has decreased and come into a steady state.

11. The process according to claim 10, wherein the size degradation and dispersant coating is carried out in a basket mill with zirconium balls as a grinding medium.

12. The process according to claim 11, wherein size degradation and dispersant coating is carried out at an accelerative force within the range of from 50 g to 70 g on the liquid.

13. The process according to any of claim 11 or 12, wherein only part of said at least one liquid and/or said at least one dispersant has been used when preparing the mixture of said at least one liquid soluble in oil and said at least one dispersant, the remainder of the dispersant and liquid being added after said graph over the sediment height in samples taken periodically and being centrifuged at a fixed rate for a fixed period has reached a plateau.

14. A fuel additive composition for the reduction/removal of vanadium-containing ash deposits in gas turbines and other by combustion of vanadium-containing fuel driven apparatuses, said composition comprising an active ingredient dispersed in at least one liquid selected from the group consisting of liquids soluble in

oil, by means of at least one dispersant selected from the group consisting of low molecular weight dispersants and high molecular weight dispersants,

wherein said active ingredient is an inorganic oxygen-containing compound of a metal in particle, non-crystalline form when added to the fuel,

wherein when heated in a combustion flame said active ingredient liberates a gaseous substance by evaporation and forms a corresponding metal oxide having a crystalline porous structure,

wherein dehydration and decomposition of said active ingredient takes place in the combustion process,

wherein said active ingredient comprises a compound of a metal capable of forming a vanadate with vanadium of said ash deposits, and

wherein said active ingredient and said corresponding metal oxide have a particle size distribution within the range of from 0.1 to 2 micron, and said corresponding metal oxide having a density of at most 2.0 g/cm^3.

15. The fuel additive composition according to claim 14, wherein said inorganic oxygen-containing metal compound or oxide comprises from 20 to 50% by volume, calculated on the total volume of the composition.

16. The fuel additive composition according to claim 14, wherein said inorganic oxygen-containing metal compound or oxide comprises from 30 to 40% by volume, calculated on the total volume, of the composition.

17. The fuel additive composition according to claim 14, wherein said inorganic oxygen-containing metal compound or oxide comprises from 40 to 50% by volume, calculated on the total volume, of the composition.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.